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ABSTRACT

To investigate the assumptions that interpersonal problem solving skills can be systematically taught to young children and that such skills mediate behavioral adjustment, 37 black, economically disadvantaged preschool age children participated in a year-long intervention project and a 6-month follow-up. Specifically, the study evaluated the long-term effectiveness of the Spivack and Shure training program in bringing about changes in cognitive interpersonal problem solving and behavior. The intervention program consisted of a series of brief, daily "games" involving small groups of children. Games initially focused on language skills related to alternative, consequential, and causal thinking, then explored individual's likes and dislikes, culminating in the application of skills and concepts in the contexts of real life situations. After training with the games, subjects were seen three times for individual testing by research assistants who administered the Preschool Interpersonal Problem Solving Test, the What Happens Next? Game, and the Caldwell Preschool Inventory. Additionally, each child's behavior was observed on three separate occasions by trained observers using the Sharp Behavior Checklist. The Hahnemann Preschool Behavior Rating Scale was completed for each child by the classroom teacher after she had known the child for 3 months. Findings indicate that behavior change in young children cannot be mediated through a strictly cognitive intervention and that behavior change requires an integration of behavioral and cognitive techniques. (Author/RH)

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A Follow-up Evaluation of Social Problem Solving Training: Cognitive and Behavioral Effects[1]

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Running head: Social Problem Solving Training

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Abstract

The long term effects of Spivack and Shures' social problem solving training were assessed and compared to an attention-placebo control. Thirty-seven preschool age children were involved in this year long intervention project and six month follow-up. All subjects received 40 sessions of intervention by specially trained assistants. Support was found for the cognitive effectiveness of social problem solving training with aberrant children at post test in that they gained signficantly in their ability to generate alternative solutions to interpersonal problems. This differential effect was not sustained at follow-up. Blind teacher ratings of behavioral adjustment and independent observers' ratings of behavior (using a naturalistic observation scale developed for this study) revealed no significant behavioral training effects at post test or at follow-up. Findings indicate behavior change in young children cannot be mediated through a strictly cognitive intervention,and requires an integration of behavioral and cognitive techniques.

The pioneering work of the Hahnemann social problem solving research team in Philadelphia has been based on the twin assumptions that cognitive interpersonal problem-solving skills can be learned, and, further, that such skills bear directly on behavioral adjustment in young children (Spivack & Shure, 1974). These studies have consistently found increases in the ability to generate alternative solutions and consequences to interpersonal problems in lower income, nonwhite preschool children as a result of the Hahnemann intervention program. The improvements in cognitive skills were reflected in parallel improvement in behavioral adjustment as rated by classroom teachers (Spivack, Platt & Shure, 1976).

Given such initially favorable results, other investigative teams have adopted this strategy in their school-based preventive efforts. The findings accumulated to date have been equivocal. While several studies using somewhat different training programs, populations, and measures have indicated that social problem-solving skills can be taught, these findings have not been consistent across studies (Gesten & Weissberg, Note 1). Thus, it appears that the effective training of such skills remains at least partially elusive.

In addition, in those instances where problem-solving skills are successfully entrained, surprisingly few investigators have evaluated the durability of these changes. We find, therefore, a number of research efforts in which significant and important posttest results are not subjected to the crucial test of time (Stone,Hinds,& Schmidt,1975; Pitkanen,1974; Houtz & Feldhusen, 1976). In fact, in cases where adequate follow-up investigation of initially positive findings has been implemented, a different picture emerges. For example, a research team at the University of Connecticut obtained findings in a four-month follow-up of their training program, which indicated the

transient nature of changes on various measures of social problem solving (McClure, Chinsky & Larcen, 1978).

Furthermore, investigators who have attempted to evaluate social problem solving training from the perspective of the transfer of these skills to classroom performance, have failed to obtain consistently positive results (Krasner & Rubin, Note 2). The question of the adaptive generalization of these skills to behavior in other settings thus remains one of the most pressing questions in this field of investigation (Urbain & Kendall, 1980). Nevertheless, despite the volume of research effort and the increasingly sophisticated awareness of methodological issues in this area, none of these investigators have attempted an exact replication of the trend-setting Spivack and Shure work.

Recent work by the Wayne State University group (Rickel & Burgio, Note 3; Sharp, Note 5) has questioned the validity of the underlying assumptions of this appealing strategy for improving behavioral adjustment in young children. Using a highly similar center-city population in the Detroit Public Schools, a comprehensive three-phase project was executed. This series of investigations represents the only exact and extended independent replication of the work of the Hahnemann social problem-solving team.

Several methodological problems in the Hahnemann group research were noted. It is unclear, from their studies, whether significant results were due to teacher/rater bias in making behavioral adjustment ratings, lack of random assignment of children to treatment groups, inadequate control groups, or the intervention program itself. The Wayne State University group, in an attempt to clarify causal relationships, made several significant improvements to the original design, including random assignment to treatment and control

groups, the use of an attention control group, blind ratings of adjustment, and naturalistic observation of child behavior.

Rickel and Burgio's (Note 3) large-scale correlational study, replicating Shure, Spivack and Jaeger (1971), represents the first phase of the project. It involved the gathering of information on cognitive interpersonal problem-solving skills, behavioral adjustment, and achievement of children enrolled in the Detroit Public Schools Title I Preschool Programs. Behavioral adjustment groups did not differ significantly on measures of alternative solutions thinking, consequential thinking, or cause-and-effect relations. The pattern of group means on the alternative solutions measure was, however, in the predicted direction. That is, behaviorally adjusted children as a group gave a greater mean number of alternative solutions than did impulsive children, who, in turn, scored higher than inhibited children. Results further indicated that behavioral adjustment classification was significantly predictive of achievement. This phase of the project raises a question as to the validity of the original assumption that the relationship between teacher-rated classroom adjustment and problem solving skills exists.

Phase two of the Wayne State University project addressed the assertions made by the Hahnemann group that a cognitively-based training program could enhance the development of problem-solving skills, thereby mediating improved behavioral adjustment. Utilizing the Spivack and Shure (1974) 46 day training program script exactly, Sharp (Note 5) assessed the impact of the intervention on cognitive problem solving and behavioral adjustment. The Spivack and Shure program consists of a series of brief, daily "games" involving small groups of 4-6 children. The earliest games deal with the understanding of selected

language skills which are thought to be related to alternative, consequential, and causal thinking. Language concepts which receive particular attention include "and", "or", and "not". The program continues with each new step built directly on preceeding ones. Children receive training in "if-then" logic, as well as in the identification of emotions in others thru these games, which are primarily verbal in nature.

Other games included in the program deal with individual likes and dislikes of the children. Special emphasis is placed on the fact that different people like different things. The concept of fairness is also the subject of several lessons later in the program. The final lessons involve a synthesis of the skills and concepts that were learned throughout the program. These lessons are made up of a series of real-life problems to which the children are to apply the skills they have learned, including alternative solutions thinking, consequential thinking, and causal thinking.

As a whole, the program involves a great deal of repetition and reinforcement of key concepts. There is a specific emphasis on the non-judgemental attitude of the instructor / trainer. The children are essentially being taught to think of, and evaluate the efficiency of, their own solutions to everyday problems. Of primary importance is the principle that cognitive problem-solving skills and prerequisite concepts are "not taught as ends in themselves but as antecendent mediating skills necessary to enhance behavioral adjustment, reduce maladaptive behaviors and help the young child acquire behaviors through which he can function successfully with peers and adults" (Spivack & Shure, 1974).

Several improvements were included in Sharp's design. Where Spivack and Shure used classroom teachers as trainers, Sharp used specially trained graduate and undergraduate assistants. This allowed the classroom teachers to remain blind to the purpose of the study, the content of the treatment sessions, and the assignment of children to treatment conditions, eliminating a major source of confounding. An attention-placebo group, which also had a group experience with the assistants, served as controls. This ensured that the Hawthorne effect was not responsible for observed treatment effects. Another unique contribution was the development and use of a naturalistic observation scale and trained independent observers, which allowed for a more objective evaluation of behavior change.

Analysis of Sharp's data on cognitive problem-solving skills, teacher ratings of behavior, and independent ratings of behavior, yielded several interesting results. Support was found only for the Shure and Spivack finding that aberrant children gain significantly in their ability to generate alternative solutions as a result of their participation in social problem-solving skill training. These results suggest that this represents an effective replication of the training program. There were no significant training effects for consequential thinking, observed behavior, or teacher-rated behavioral adjustment. Sharp concluded that the results of this study suggested that although cognitive problem-solving skills to some extent could be learned, enhancement of these skills did not mediate behavioral adjustment, either as rated by teachers or observed by independent raters. This failure to replicate the Spivak and Shure results may be due to the fact that their teachers were not blind to treatment assignments.

Several questions remained unanswered following phase two of this replication. In view of the fact that young children often need time to assimilate new learning (Piaget, 1970), and in order to determine whether aberrant treated children maintain their cognitive gains, a follow-up evaluation was deemed important. The importance of such longitudinal outcome assessment was emphasized most recently in a comprehensive review by Urbain and Kendall (1980). The purpose of the current study was to further explore the initial assumptions of the Hahnemann group, and to evaluate the effectiveness of the Spivack and Shure training program in bringing about long-term and durable changes in cognitive interpersonal problem solving and behavior. This aspect of the project represents the only independent follow-up evaluation of the Spivack and Shure intervention program and corrects the methodological weaknesses of their design.

Method

Subjects: In phase one of this project (Rickel & Burgio, Note 3), the subjects were all of the 110 preschool children enrolled in the Detroit Public Schools Region 7 Title I Preschool Programs. All of the 58 boys and 52 girls were black, from lower-income families, and ranged in age from 3 years, 9 months, to 4 years, 9 months. At the end of phase two, which consisted of the training program and post-testing, complete data was available for 54 children. Subject attrition, as is typical in longitudinal field research, was due to a number of factors, including: poor school attendance resulting in exposure to less than half of the training program, forced withdrawal because of failure to comply with Public Health Service immunization requirements, or families moving out of the school district.

For the current follow-up study, phase three of this project, 37 of the original children were tested. Twenty-three were classified as adjusted, 14 as aberrant. They ranged in age from 4 years, 9 months, to 5 years, 9 months.

Research Staff: Six undergraduate research assistants were chosen on the basis of interest, ability to develop rapport with young children, and college grade point average. The assistants were thoroughly trained in administration of the tests according to the PIPS Manual (Shure & Spivack, 1974) and procedures outlined by Spivack et al. (1976). The assistants were also trained in the behavioral observation method developed by Sharp (Note 4). Non-subject preschool children were used for pilot testing and observation. These research assistants were kept unaware of the subject children's previous experience in either the training or control groups.

Instruments: (a) Preschool Interpersonal Problem Solving (PIPS) Test: The PIPS Test consists of a series of interpersonal problems presented to a child both verbally and pictorially. It is used as a measure of alternative solutions thinking. Two types of problem situations are portrayed. In the first, peer problems are depicted in which one child wants to play with a toy another child has. The second type of problem situation involved a child who has done something about which his or her mother is expected to be angry. In each case, the child being tested is asked how the child in the story could solve the problem with which he/she is faced. The test is scored by counting the total number of qualitatively different solutions the child offers. Solutions of the same type are thus scored only once. The test-retest reliability of the PIPS is .73. In the administration and scoring

of the PIPS Test, the precise instructions found in the PIPS Test Manual (Shure & Spivack, 1974) were followed.

(b) What Happens Next? Game: This measure is used to assess consequential thinking abilities. Similar to the PIPS Test, it consists of a series of verbally and pictorially presented problem situations. Again, there are two types of situations: one involving a child grabbing a toy from another child; and a second in which a child has taken something from an adult without asking permission. The child being tested is asked to tell what might happen next. The test is scored by counting the number of qualitatively different consequences offered by the child (Spivack et al., 1976).

(c) Caldwell Preschool Inventory: This Inventory is a 64-item achievement measure assessing the following attributes in 4 subtests: Personal-Social Responsiveness, Associative Vocabulary, Concept Activation-Numerical, and Concept Activation-Sensory. The Inventory was designed for individual oral administration to young children in the 3 to 6 year age range. Standardization of the Inventory was based on the responses of 1531 children enrolled in Head Start classes in the fall of 1969. The Head Start programs were from all regions of the United States. Sixty-eight percent of the subjects in the standardization sample were black, and a test-retest reliability of .88 is reported (Caldwell, 1970).

(d) Hahnemann Preschool Behavior Rating Scale: The Hahnemann is an instrument designed to assess the overall adjustment of children based on their classroom behavior. Each child is rated using the following seven behavioral descriptions: persistant and nagging, easily upset by peers, easily upset by adults, dominant, physically aggressive, prone to emotional

upset, and impatience. Ratings are made on a Likert type scale from one to nine, ranging from withdrawn to aggressive. These teacher ratings yield three behavioral adjustment groups: inhibited, impulsive (aberrant) and adjusted (Spivack et al., 1976).

(e) Sharp Behavior Identification Checklist: This scale was developed as a direct observational measure of the type and frequency of children's interpersonal problem solving behavior. It was designed to include high frequency behaviors of preschoolers observed in a small group free play situation, and more specifically, those behaviors listed as alternative solutions on the PIPS Test (Sharp, Note 4).The frequencies of several categories of behavior, including distractible behavior, aggressive behavior, cooperative behavior, and solitary behavior were tabulated, using a combination event and time sampling method. Children were observed in groups of four, in three different situations involving potential conflict: a free play situation, a free play situation with a very limited supply of attractive toys, and a drawing task where each group is given only one crayon and one piece of paper. Children were observed for 40 ten second intervals in each situation by a trained observer on three different days. Typically, groups were composed of two boys and two girls.

Inter-observer reliability, based on simultaneous 40 interval observation of four individual children, was calculated and ranged from 76% to 97%. Overall inter-observer agreement was 88%. A child's score for each behavior category was the frequency of that behavior, summed across 120 ten second intervals, 40 intervals for each of the three play situations. Rickel & Burgio's (Note 3) principle components factor analysis with varimax rotation

used in scoring yielded three factors from the Sharp Behavior Identification Checklist. The factors were labelled cooperative, aggressive, and passive/ solitary.

General Procedure: The children were seen three times for individual testing by the research assistants. Administration of the tests was in the following order: PIPS Test, What Happens Next? Game, and the Caldwell Preschool Inventory. There was at least a three-day time lapse between an individual child's testing sessions. The order of administration was consistent with that used at pre- and post-testing. Also at this time, each child's behavior was observed on three separate occasions using the Sharp Behavior Checklist. The three observation sessions occurred on separate days, with approximately four to five days in between. The Hahnemann Preschool Behavior Rating Scale was completed for each child by the classroom teacher after she had known him/her for three months.

Results

The analyses of these data were guided by the following questions: (a) How effective was the Spivack and Shure training program in facilitating long-term changes in cognitive interpersonal problem-solving skills in young children? and (b) How effective was the program in promoting behavioral adjustment?

Cognitive Effects of Social Problem Solving Training.

On the basis of previous findings by the Hahnemann group, it was predicted that there would be significant improvement in interpersonal problem-solving scores as a function of treatment and behavioral classification. Therefore, a 2x2x3 multivariate analysis of variance examined the effects

of pre-test behavioral classification, treatment group assignment, and time (pre-, post-, and follow-up) on cognitive interpersonal problem-solving scores. Results indicated a highly significant multivariate effect for time ($F(12,22) = 30.793$, $p < .001$), and follow-up univariate analyses revealed that for all dependent variables this effect represented significant improvement on the Caldwell ($F(2,32) = 165.17$, $p < .001$), the PIPS ($F(2,32) = 85.00$, $p < .001$), and the WHNG ($F(2,32) = 30.18$, $p < .001$). See Table 1 for the means and SD's.

There was, however, a notable absence of significance of treatment or behavioral classification main effects ($F's > 1$). This is particularly interesting in light of Sharp's (Note 5) finding of differential improvement on alternative solutions thinking among aberrant treated children. The disappearance of this effect is reflected in the significant behavioral classification by time interaction on PIPS Test Scores. This effect is illustrated graphically in Figure A. Here we see that while aberrant children gained significantly in their ability to generate alternative solutions from Time 1 until Time 2, there was essentially no change in their performance from Time 2 until Time 3; this was also true on the Caldwell Inventory.

Behavioral Effects of Social Problem Solving Training.

Translating the concept of adjustment as measured by global teacher ratings into the more specific factors of the Sharp Behavior Identification Checklist, it was predicted that the groups of children who received the interpersonal problem solving training program would show more cooperative behavior, less aggressive and less passive/solitary behavior, from pre-test to post-test to follow-up. No changes were expected in the placebo control groups which did not receive the intervention.

A 2x2x3 multivariate analysis of variance was performed on the three factors of the Behavior Checklist. For all three factors of the Behavior Checklist, the time effect was significant (cooperation: $F(1,29) = 10.23$, $p < .001$; aggressiveness: $F(1,29) = 24.88$, $p < .001$; passive/solitary: $F(1,29) = 21.40$, $p < .001$), suggesting that there are significant changes in children's behavior over time regardless of treatment condition. There were no significant treatment effects for any of the three factors ($F's > 1$). There were, however, significant effects related to pre-test behavioral classification for both the aggressiveness ($F(1,29) = 3.7$, $p < .04$) and passive/solitary factors ($F(2,29) = 3.96$, $p < .03$). The children initially rated by their teachers as aberrant consistently showed more aggressive behavior, and less passive/solitary behavior at all three time periods.

In summary, while the treated groups did show increased cooperative behavior from pre-test to post-test, this effect cannot be attributed to the treatment, since the untreated adjusted group showed a similar trend. None of these groups maintained the increased cooperativeness at follow-up. The aggressiveness factor, contrary to prediction, showed that all groups increased in aggressive behavior from pre-test to post-test. The two control groups and the treated adjusted group showed decreased aggressive behavior from post-test to follow-up. The two treated groups showed a decrease in passivity from pre-test to post-test, which was not maintained at follow-up. For each time sampled, the aberrant children did emit more aggressive behavior and less passive/solitary behavior than the adjusted children. These findings were contrary to what was predicted.

Behavioral Adjustment and Problem-Solving Skills.

It was predicted that there would be significant positive correlations between adjustment and interpersonal problem solving skills. Better adjusted children were expected to score higher on tests of both consequential thinking and alternative solutions. Table 2 shows the Pearson correlation coefficients between the Hahnemann Preschool Behavior Ratings and the two measures of interpersonal problem-solving skills, alternative solutions and consequential thinking. Contrary to Spivack and Shure (1974) predictions, there do not appear to be any strong, consistent relationships between teacher rated adjustment and either measure of problem solving thinking.

The relationship between interpersonal problem-solving skills and observed behavior was also explored. It was predicted that children who scored higher on measures of alternative and consequential thinking would show more cooperative, less aggressive, and less passive/solitary behavior. Table 2 presents the Pearson correlation coefficients between the factors of the Sharp Behavior Identification Checklist and the number of relevant responses given on these measures of problem solving. In addition, there do not appear to be any stable, consistent relationships between these problem-solving skills and independently observed behavior. Consistent with these findings, it should be noted that the Hahnemann Preschool Behavior Rating Scale and the Sharp Behavior Identification Checklist are highly correlated ($r = .79$, $p < .001$).

Discussion

Implicit in this investigation is a questioning of the basic assumptions made by the Hahnemann research group. These assumptions, stated

previously, suggest that cognitive interpersonal problem-solving skills can be systematically taught to young children, and, further, that such skills mediate behavioral adjustment.

In the present study, all groups regardless of pretest behavioral adjustment classification and of treatment group assignment, show improvement from pre-test to follow-up testing on the alternative solutions measure. This same effect across time is found for consequential thinking and for achievement. We find no differential effects of training or behavioral classification. Overall, it appears that normal maturational processes and general educational stimulation can account for the improvements seen in generating alternative solutions, in consequential thinking, and in achievement. At this point, we must address the implications of the fact that in the Wayne State University studies, as opposed to the Hahnemann studies, problem-solving skill training does not appear to promote long-term gains in cognitive interpersonal problem-solving strategies. It is possible, first of all, that the failure to find consistent results is possibly attributable to significant differences in the degree of aberrance in the populations of children participating in the Hahnemann (Philadelphia) studies and the Detroit studies. However, when mean pre-test PIPS for aberrant children in both studies are compared, the difference does not attain statistical significance. Differences in the degree of aberrance are, therefore, unlikely to account for the disparity between the results of the two studies.

Another possible explanation would be that the Hahnemann group may not have included all of the active elements in the printed treatment script. The changes they reported may have been due to some component other than the

training program per se. Comparative studies of therapeutic techniques have shown that there may be a discrepancy between what the therapist says and thinks he/she is doing, and what the independent observer might detect from analyzing verbatim process recordings (Bergin & Suinn, 1975).

It is essential, at this point, to restate that the present project is part of a larger effort, the main goal of which was to replicate, as closely as possible, the investigations of the Hahnemann group. The importance of this task cannot be underestimated and was in fact underscored in a recent American Psychological Association presentation (Gesten & Weissberg, Note 1). As such, this project involved a highly similar population, utilized the Shure and Spivack training script exactly, and was evaluated using the identical instruments with the addition of an achievement inventory and a naturalistic observation scale. Furthermore, repeated personal contacts with Shure (Note 7) were used to obtain a more precise and detailed understanding of the administration and scoring of the evaluation instruments as well as the training script.

The training program did not have the predicted effect on the observed behavior of children interacting in small play groups. The most interesting patterns in behavior were the trend toward increases in cooperative and aggressive behavior and simultaneous decrease in passive/solitary behavior from pre-test to post-test, with the reverse trend from post-test to follow-up. Since this effect was seen regardless of treatment condition, it is likely that it may be a natural, nonlinear maturational pattern (Jones, Rickel & Smith, 1980).

In summary, the relationship between cognitive interpersonal problem-solving and behavior in preschool children affords two major possibilities to consider, consistent with the present findings. The first possibility is

is that there is no strong, stable, consistent relationship at the preschool level. Since this assumed relationship formed the cornerstone of the Hahnemann treatment program, our findings raise serious doubt as to the validity of this strategy for improving behavioral adjustment in young children. It is suggested instead that the supposed relationship was dependent on the teachers participating in the program and then rating the children's behavior. When the teachers were blind to the purpose of the study, the assignment of children to groups, and the content of the treatment sessions, the effect was not seen.

If, on the other hand, such an underlying relationship does exist, it may not have become evident through this program, due to the absence of some important components of the problem-solving process. Although generation of alternative solutions and consequences may be essential elements, the mere listing of solutions and consequences may not be sufficient. It is unclear how effective the program was in promoting a general orientation to problem-solving outside the training setting, or in developing the ability to identify and define problems. In addition, in order for effective learning to occur, verification, feedback, and self-correction must be included. In order for the child to re-structure the behavioral hierarchy of responses, that is, to choose the more appropriate responses first, it may be necessary for the entire chain of problem-solving to be employed. Modeling and behavioral rehearsal, absent in this strictly cognitive approach, may help children to recognize and identify situations, and generalize the strategies to a variety of interpersonal situations, facilitating the transformation of cognitive skills into new behavior (Kendall & Wilcox, 1980).

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TABLE 1

Pre-, Post-, and Follow-up Test Means and Standard Deviations for Alternative Solutions (PIPS), Consequences (WHNG), and Achievement (Caldwell) by Adjustment for Experimental and Control Groups

Adjustment Classification	Control			Experimental		
	Pre	Post	Follow-up	Pre	Post	Follow-up
PIPS:						
Adjusted						
$\bar{X}$	4.78	8.22	11.00	4.79	8.21	10.21
SD	2.64	1.79	3.81	2.75	2.23	2.81
Aberrant						
$\bar{X}$	5.50	8.00	9.00	4.33	10.83	10.58
SD	3.54	2.83	1.41	1.92	2.55	2.78
WHNG:						
Adjusted						
$\bar{X}$	4.44	7.67	7.22	3.86	7.07	7.21
SD	2.07	1.41	3.31	2.57	2.20	2.16
Aberrant						
$\bar{X}$	3.50	7.50	8.50	4.50	7.50	7.75
SD	3.54	.71	3.54	1.83	1.45	2.01
Caldwell:						
Adjusted						
$\bar{X}$	24.89	52.67	48.11	28.14	54.64	49.50
SD	8.59	11.29	7.96	6.83	5.75	4.35
Aberrant						
$\bar{X}$	32.50	59.00	49.00	22.50	55.17	43.92
SD	17.68	7.07	15.56	9.42	8.69	9.20

TABLE 2

Pearson correlation coefficients between factors of the Sharp Behavior Identification Checklist and the Hahnemann on alternative solutions and consequences given at each time.

	r	p
COOPERATIVE Behavior		
Alternative Solutions		
pre-test	.003	.49
post-test	.06	.36
follow-up	.20	.12
Consequence		
pre-test	.03	.44
post-test	.04	.42
follow-up	.19	.13
AGGRESSIVE Behavior		
Alternative Solutions		
pre-test	.001	.5
post-test	-.23	.08
follow-up	.09	.29
Consequences		
pre-test	-.18	.14
post-test	-.11	.26
follow-up	.17	.15
PASSIVE/SOLITARY Behavior		
Alternative Solutions		
pre-test	.01	.47
post-test	.16	.16
follow-up	.30	.03*
Consequences		
pre-test	.13	.21
post-test	.16	.18
follow-up	-.04	.39
HAHNEMANN		
Alternative Solutions		
pre-test	.11	.24
post-test	.08	.32
follow-up	.49	.01**
Consequences		
pre-test	-.17	.14
post-test	.32	.02*
follow-up	.22	.07

* =< .05

** =< .01

FIGURE A

Relationship Between Hahnemann Classification and Time:

Caldwell Preschool Inventory and PIPS Test

Figure 1: Hahnemann X Time Interaction
Caldwell Preschool Inventory

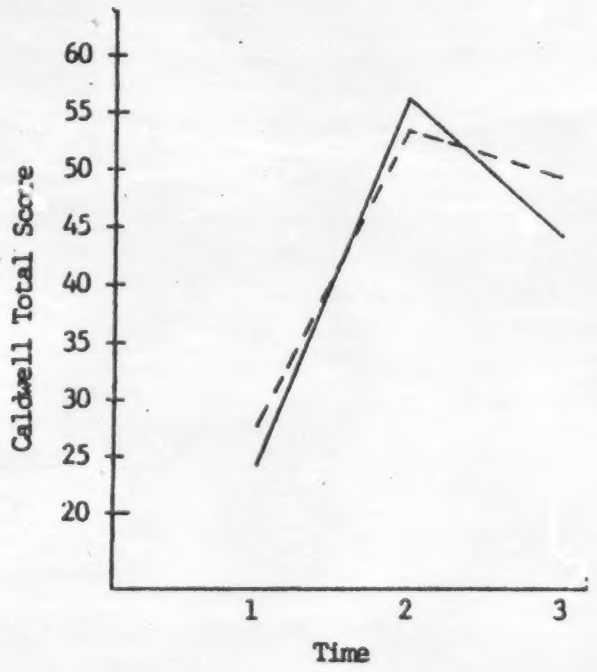
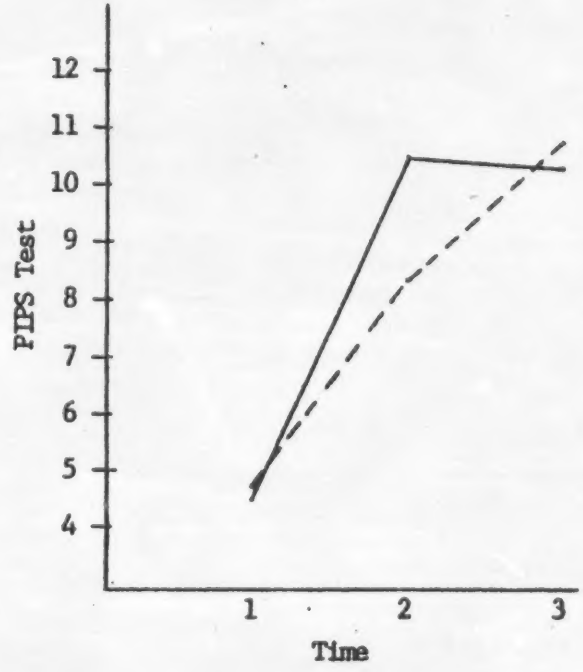


Figure 2: Hahnemann X Time Interaction
PIPS Test



____ Aberrant

----- Adjusted